

AREA FORM

AREA NAME: WINNICUT DAM AREA

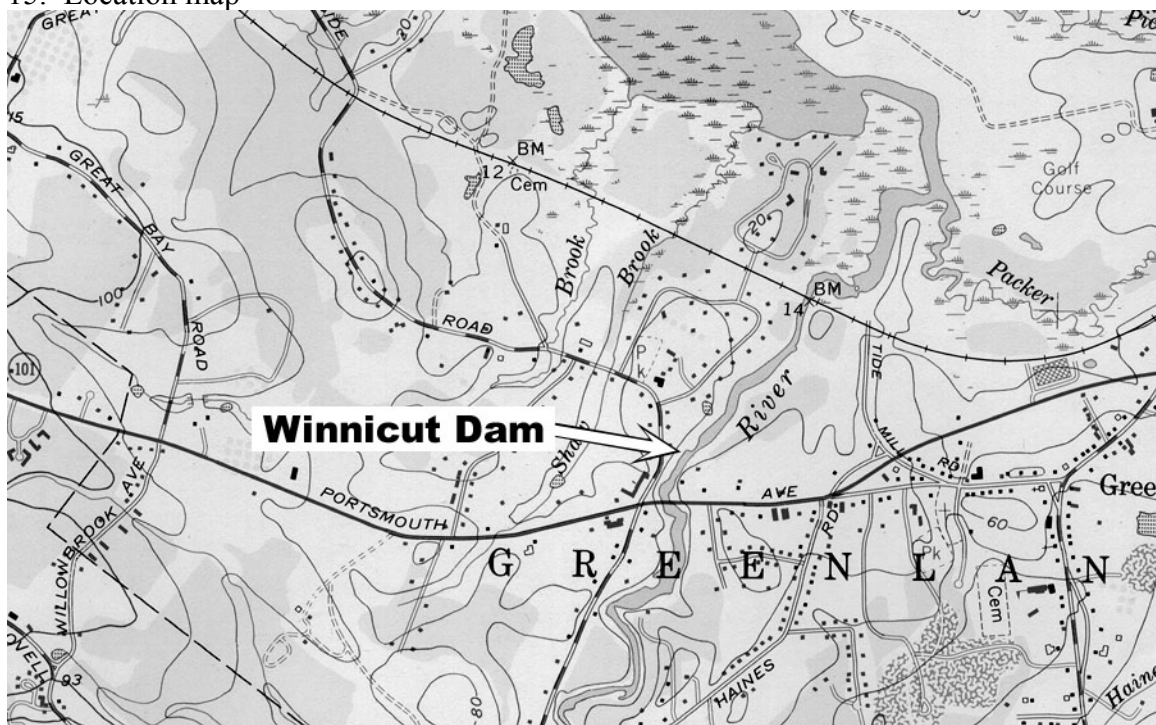
1. Type of Area Form

Town-wide: ☐Historic District: ☐Project Area: ☒

9. Inventory numbers in this area:

none2. Name of area: Winnicut Dam Area3. Location: Winnicut River, north of Route 33
near intersection of Rte. 33 and Bayside Rd.10. Setting: On the Winnicut River, in an
area of mixed residential and commercial
buildings.4. City or town: Greenland5. County: Rockingham11. Acreage: 2.0 acres6. USGS quadrangle name(s): Portsmouth12. Preparer(s): Jeffrey D. Emidy and Jo A. Deaton7. USGS scale: 1:24 00013. Organization:
the Public Archaeology Laboratory, Inc.8. UTM reference: 19 03 49 427 E 47 66 329 N14. Date(s) of field survey: August 20, 2003

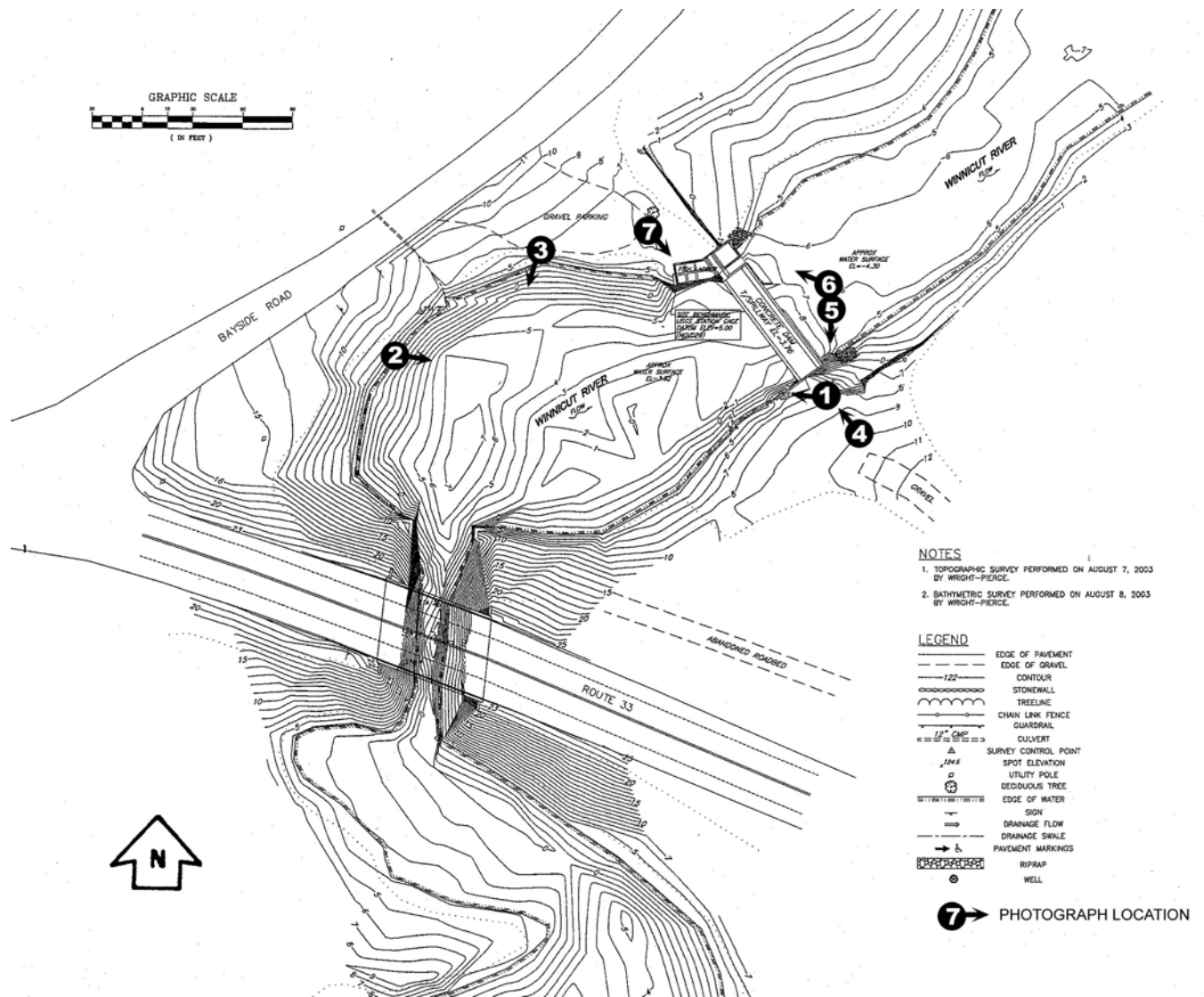
15. Location map



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16. Sketch map



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17. **Methods and Purpose:** It is proposed that the Winnicut Dam be removed, and not replaced. The area that will be physically affected by this removal consists primarily of the dam and of the riverbed extending approximately 375 feet upstream and 200 feet downstream from the dam site. Effects to resources along the riverbank are anticipated to be limited to the areas over which machinery and personnel will move during the removal of the structure. As the removal of the dam will not cause water levels to rise, resources along the banks of the river in the area immediately surrounding the dam are not expected to be affected by water infiltration. The visual effects area for the project will incorporate a wider area to the east and west of the river, from which the dam can currently be seen. Due to the deciduous vegetation along the riverbanks, this area is larger in the winter months than at any other time of the year. Field work was conducted by a team consisting of an industrial archaeologist, archaeologist, and assistant archaeologists. The team recorded with maps, photographs, and narrative descriptions the current conditions of the project area. They also conducted research at the Weeks Library (Greenland) and Rockingham County Register of Deeds to gather historical information pertaining to the development of Greenland, history of the Winnicut River, and history of the dam. Sources included historic maps of Greenland and the surrounding area and general histories of the town. Local historian Paul F. Hughes was contacted, and his collection of newspaper clippings, photographs, and other materials relating to the town, its mills, and the Winnicut Dam was utilized. Records of the New Hampshire Department of Environmental Services were also examined to gain information about the history of the dam, its construction methods and materials, and its maintenance and use since its erection.

18. **Geographical Context:** The Winnicut Dam project area is situated within the town of Greenland, Rockingham County, New Hampshire, in the Piscataqua River watershed. The drainage area of the Piscataqua River at the point where it discharges into the Gulf of Maine in Portsmouth Harbor is approximately 1,500 square miles. Significant hydrologic features of the watershed include the Bellamy, Cocheco, Lamprey, Oyster, Salmon Falls, Squamscott, and Winnicut rivers, Great Bay and Little Bay. The Piscataqua River is approximately 12 miles long and is tidally influenced over its entire length from the confluence of the Cocheco and Salmon Falls rivers to the point where it enters the Gulf of Maine. The Winnicut River discharges into the southern portion of Great Bay in the town of Greenland from headwaters in the towns of Stratham, Hampton, and Hampton Falls, New Hampshire.

Rockingham County lies within the Seaboard Lowland physiographic province. This province is characterized by gently rolling topography with low relief and subtle breaks between major landforms. The underlying bedrock in the Greenland area comprises a metamorphic complex of calc-silicate biotite granofels, phyllite and schist. The primary soil association within the Winnicut Dam project area is the Hoosic-Canton-Chatfield association. Soils in this group are very deep to moderately deep loams that are nearly level to steep and are well-drained to somewhat excessively drained. The major soil types include Pennichuck channery very fine sandy loam (460B) and Eldridge fine sandy loam (38A). Pennichuck soils are best suited for crops and forage purposes, but also are particularly valuable to the production of sawlogs and lower grade pallet logs from native hard- and soft-woods. Eldridge sandy loams are best suited to woodland purposes and are dominated by eastern white pine and red oak. The depth to bedrock is typically greater than 1.5 meters, and while these soils are classified as moderately well drained, they remain saturated through the early spring and again in the fall (USDA 1994).

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Riverine and palustrine habitat dominates the Winnicut River environmental profile upstream of the dam, while the downstream portion comprises a brackish estuarine habitat. The mile-long reach of the Winnicut River between the Winnicut Dam and Great Bay is tidally influenced, and the environmental profile is dominated by saltmarsh (Woodlot Alternatives 2003).

Total annual precipitation for the county measures approximately 43 inches, with the majority falling from September to April. Seasonal snowfall averages about 69 inches. Rockingham County's coastal location provides a comparatively more temperate environment than more inland and northerly sections of the state, with an average winter temperature of 24 degrees Fahrenheit and an average summer temperature of 67 degrees Fahrenheit (USDA 1994).

19. Historical Background: The area that became the Town of Greenland in 1721 was initially part of Portsmouth and was first settled in the mid-seventeenth century. The area's early economy was based on lumbering, fishing, farming, and maritime commerce. Its location near the southern shore of Great Bay made Greenland an ideal transshipment point for lumber that was harvested inland and floated on the Winnicut River and other tributaries that feed into the bay for processing and exporting to England (Hughes 2002). The brackish waters of the Winnicut River created the specific spawning conditions necessary for smelt and river herring to breed successfully, and fishing became an important source of food and income for early Greenland residents (SRRC 1981).

Beginning in the mid-seventeenth century, a series of dams was constructed on the Winnicut River and its tributaries to provide power for grist and sawmill operations (Hughes 2002). Philip Lewis and Isaac Cole developed the first dam and millpond in Greenland in the late 1660s, after they were granted a sawmill privilege on the east side of the river (Bolster 2002:108). Circa 1670, the mill was sold to Samuel Haines, a former indentured servant who moved from Dover and became Greenland's first permanent resident. Nathaniel Huggins constructed a gristmill directly across from this mill on the west bank of the river in 1685 (Hughes n.d.). While no maps dating to these earliest mill privilege grants could be located, the 1806 map of Greenland depicts a saw and gristmill within the project area on the east and west banks of the Winnicut, respectively (see page 14 for historic map) (Merrill 1806).

The first mill remained in the Haines family until the Weeks family purchased it in 1815. Over the next several years, the Weeks family gradually sold their shares in the old Haines mill to the Brackett family. In 1821, Theodore Burleigh purchased a separate mill privilege from the Weeks and Johnson families for the purpose of erecting a fulling mill. This privilege was located on the west bank of the river, downstream from the Great Bridge (site of the current Route 33 bridge over the Winnicut River). Inherent in the mill land deeds was the mill privilege and the caveat that one miller not interfere with the others' milling (Hughes n.d.). In 1823, Burleigh expanded his holdings by purchasing the adjacent Huggins' grist/corn mill (Hughes n.d.).

In 1861, Burleigh sold both mills on the west bank of the river to George Brackett. The next day, George Brackett conveyed a portion of the rights to William H.L. Brackett. In 1864, the Bracketts sold the west shore mill properties to Charles Hatch and Moses Mann, who established the Union Mills Corporation. Union Mills later acquired the east shore mill from the Brackett family and incorporated it into the operation. The Union Mills – fulling, gristing and sawing – were profitable for many years, however, toward the close of the century their value sharply declined and they were sold to an unknown buyer. Some time between 1892 and 1895, the three mills were destroyed by fire, as confirmed by their

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presence on an 1892 map of Greenland, and absence on an 1895 U.S. Geological Survey map (see pages 15 and 16 for historic maps) (Hughes n.d.; Hurd 1892; USGS 1895).

In 1898, Emma Holmes, a former president of the Union Mills, purchased all three properties along with the water rights and privileges. She then leased the property to Simeon Brackett. Brackett rebuilt the east shore mill, and operated a combination grist and sawmill until about 1916, however, the mill is not clearly shown on the 1916 U.S. Geological Service Dover Quadrangle —nor does it appear on the 1941 version (see pages 17 and 18 for historic maps) (USGS 1916, 1941). Between 1917 and 1922, Holmes leased the building, known by that time as the Holmes Mill, to Walter Drucker. Arnold Holmes purchased the property in 1922 and ran the sawmill for several years. Harry L. Peckham then purchased the mill and privileges in 1941, and operated the sawmill until the next year, when the dam was washed out (Hughes n.d.; RCRD n.d. 980:415).

In 1946, Peckham sold the property to Harold Secord, who, only one month later, transferred it to Paul H. Winslow (RCRD n.d. 1053:430, 1047:443). Winslow applied to the New Hampshire Water Control Commission in February 1948 for approval to reconstruct the dam. In March 1948, his application was approved by the Commission (NHDES n.d.). No evidence was located that indicates that Winslow did construct a dam at the site before 1955, when he sold the land to Walter and Rebecca Ciechon (RCRD n.d. 1371:206). Conversely, a 1956 letter from T.R. Meyers, of the New Hampshire State Planning and Development Commission, to the Water Resources Board references communication from the Town of Greenland for support “to plan for the reestablishment of a dam on the Winnicut River” (NHDES n.d.). This, and other documents referring to the “dam site” imply that between 1942 and 1957, the river was not dammed. The Ciechons granted flowage rights and the right to erect and maintain a dam on the Winnicut River to the State of New Hampshire in September 1956, and in 1957, the dam was constructed (RCRD n.d. 1426:062). In 1959, the Ciechons sold ½ acre of land on the west side of the dam to the state to allow limited public access to the pond (RCRD n.d. 1507:070). In 1962, the land around the dam was sold by the Ciechons to Ruth A. Simoneau, who, in 1971, sold it to the State of New Hampshire (RCRD n.d. 1622:203, NHDES n.d.). The state retains ownership of the dam to this day.

The state’s intent in 1957 was to construct a dam to create a waterfowl habitat and a slackwater impoundment for fish. Realizing that the dam would impede the progress of anadromous fish to and from Great Bay, a fishpass was constructed on the western side of the dam. It was soon clear, however, that the fishpass’s pool configurations, steep drop between the pools, and high water turbulence presented a difficult obstacle to the native smelt and river herring migrations. By 1965, after the anadromous fish runs had ceased, the state proposed improvements to the pool and ladder configuration, but those improvements were never fully implemented (NHDES 1965).

No elements of the original dam are known to have been reused in the construction of the existing structure. Proposed plans for the dam incorporated parts of the old masonry walls as the core of the wing walls, however, it cannot be confirmed at this time whether this plan was fully carried out (NHFGD n.d.). The old Holmes mill on the eastern bank of the river was used as an administrative building by the New Hampshire Fish and Game Department during this period, but the building gradually fell into disrepair. The integrity of the building was so compromised by the early 1980s that it was eventually burned and razed as part of a fire training exercise (Cheri Patterson, personal communication 2003). Two fieldstone wall segments located on the east bank of the river may be remnants of the Holmes Mill.

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The dam remains in much the same form as when it was built in 1957. Waterfowl have returned to the area above the dam, as intended in its planning. The impoundment created above the dam is stocked with trout, and is a popular area for fishing. There are currently limited numbers of smelt spawning in the reach of the Winnicut River below the dam. Due to a program of ongoing maintenance, limited numbers of river herring are able to ascend the existing fishpass and utilize spawning habitat upstream of the Winnicut Dam.

20. Applicable NHDHR Historic Context(s): Logging, lumbering and saw mills, 1620-present; Wood products mills and shops in New Hampshire; Grain farming and grist milling, 1650-present

21. Architectural Description and Comparative Evaluation: The Winnicut Dam (#99.01) is located on the Winnicut River in Greenland, New Hampshire, in a commercial and residential area just north of Route 33 and east of Bayside Road. The west side of the intersection of Bayside Road and Route 33 is dominated by two shopping plazas, one each on the north and south sides of Route 33. A few houses are located on the east side of Bayside Road, nearer to the road than the river, as the road curves to the west. A residential area developed in the latter half of the twentieth century is found to the northwest of the dam area, on the east side of Bayside Road. Along Route 33, no buildings are present between Bayside Road and the river. East of the river, however, residential buildings line both sides of the road. Also on the east side of the river, to the northeast of the dam area but not within sight of the dam, is a single house.

The next bridge to the north of the dam site is a railroad bridge that crosses the river approximately 3/8 of a mile downstream. The south end of the area is defined by the Route 33 bridge over the river, which was constructed in 1960. The bridge has a steel substructure atop concrete abutments, and replaces an earlier bridge on an alignment just north of the present alignment. The stone bridge abutments of the previous bridge remain at the site (Photograph 3). Other historical remnants at the site include a stone wall on the west riverbank that extends away from the river, and two fieldstone walls on the east riverbank that parallel the river. The western wall appears to be the remains of a foundation wall associated either with Burleigh's Fulling Mill, ca.1821, or the Union Mills, ca. 1864-1895. The walls on the east side of the river appear to be retaining walls for the Holmes Mill. The Holmes mill foundation, located at the east end of the dam, is apparent as a bermed area that appears to have been filled after the mill was burned.

The west riverbank from Route 33 north beyond the dam is particularly steep at the northeast corner of Route 33 and Bayside Road, where fill appears to have been added during the realignment of Route 33 in 1959/60 (Photograph 1). As the slope rises from the river to the road grade, it levels off, forming a flat area alongside the road. The steeply pitched portion of the embankment is covered with trees and scrub vegetation, while the flatter area is covered primarily with grass. The largest opening in the vegetation is a gravel parking area west of the dam. Mature maple and beech trees dominate the riverbank north of the dam. Along the east side of the river north of Route 33, the land rises steadily, but not steeply. The slope is wooded with a sizeable grassy opening adjacent the east end of the dam that is used for fishing and recreational purposes (Photograph 2). This area is accessible via an unpaved road off of Route 33.

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The Winnicut Dam is a concrete gravity dam, constructed in 1957 for the purpose of creating an impoundment for recreational use. It replaced a previous dam of wood and broken stone over packed earth construction that was breached in 1942. The extant dam is 82 feet (ft) long, 2 ft wide at the top, 20 ft wide at the base, and incorporates a 75 ft long spillway and a 4 ft wide stoplog bay (Photograph 4). The upstream face of the dam is a straight rise to a height of 13 ft. The downstream face is sloped to a thickness of 12 ft at the base, with an 8-ft, flat concrete apron projecting downstream from the base. The east wing wall of the dam is sloped from its ends toward the top, where it has a flat run opposite the crest of the dam (Photograph 5). The west wall is shorter and steeper than the east on the downstream side, but extends further to the north on an angle away from the dam as it serves as the east wall of the fishpass (Photograph 6). Other features of the dam include 4-inch vent pipes on the downstream face spaced approximately 8 feet on center, 1-inch vent pipes on the north face spaced 4'6" on center, and steel steps protruding from the concrete wing walls to access the walkway across the crest of the dam.

The fishpass is a Canadian step wier constructed integral with the dam between the west abutment and the stoplog bay. It is a poured concrete structure that was constructed at the same time as the dam. The ladder is made up of twelve cells arranged in two rows of six along the angled plan. With the exception of the pair of larger cells at the angle, each has an interior space five feet square. Viewed from the top, the cells appear to be physically separated by concrete walls, however, this appearance is a function of the concrete-encased, steel beams that run along the top of the cells, tying the construction together (Photograph 7). Below these beams, the cells are open to one another. The separation of the cells is achieved by the stacking of stop logs that fit from the top into vertical slots in the concrete walls. These have openings in the bottom to allow water and fish through, while maintaining a predetermined depth of water in the cell. Each cell's floor height increases over the cell downstream of it, creating the ladder effect.

Of the dam sites recorded on the Winnicut River during the seventeenth and eighteenth centuries, none appear to remain in use today. Most of the mills affiliated with the dams burned or were otherwise destroyed in the nineteenth century, thus eliminating the need for the dams (Hughes n.d.). A dam located at Winnicut Mills on the river in Stratham has been partially breached and no longer impounds water at normal flows. The only other dam shown on USGS maps of the area is located on the north shore of Great Bay, on Peverly Brook. This dam appears on the 1916 map, and the appearance of the water body on the brook indicates that a dam was still present in 1993 (USGS 1993).

22. Statement of Significance: not applicable for Phase I survey

23. Periods(s) of Significance: not applicable for Phase I survey

24. Statement of Integrity: The Winnicut Dam project area has very little integrity. The historic resources of the area, including the timber dam, Holmes Mill, Burleigh Mill, Union Mills, and a house near the site, have all been demolished. Of these resources, the only remnants extant on the landscape are the foundation walls of the Burleigh Mill and possible retaining walls from the Holmes Mill. None of the historic resources remain at the site in their entirety.

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25. Boundary Justification: not applicable for Project Area form

26. Boundary Description: The property is currently listed in the Town of Greenland tax maps as Map R-17, Lots 58 and 60.

27. Bibliography and/or References:

Bolster, Jeffrey W. (editor)

2002 *Cross-Grained and Wily Waters: A Guide to the Piscataqua Maritime Region*.
Peter E. Randall, Portsmouth, NH.

Hughes, Paul F.

2002 *A Pleasant and Abiding Place: A History of Greenland, New Hampshire, 1635 – 2000*. Unpublished manuscript on file at the Weeks Library, Greenland, NH.

n.d. Miscellaneous primary and secondary source material on the history of Greenland, NH.
On file in the private collection of Paul F. Hughes, Greenland, NH.

Hurd, D.H. and Company

1892 *Town and City Atlas of the State of New Hampshire, Greenland*. On file New Hampshire State Library, Concord, NH.

Merrill, Phineas

1806 *Plan for the Town of Greenland*. On file, Greenland Historical Society, Greenland, NH.

New Hampshire Department of Environmental Services

1965 *Preliminary Project Statement for the Development and Operations of the Winnicut River Fishway Reconstruction*. Document on file with the NH Department of Environmental Services, Concord, NH.

n.d. Administrative Documents on file with the NH Department of Environmental Services, Concord, NH.

New Hampshire Fish and Game Department

n.d. *Proposed Dam: Winnicut River, Greenland, N.H.* On file with the NH Department of Environmental Services, Concord, NH.

Rockingham County Registry of Deeds (RCRD)

n.d. Manuscript Records on file, Rockingham County Registry of Deeds, Brentwood, NH.

Strafford Rockingham Regional Council (SRRC)

1981 *Greenland, New Hampshire: Cultural Resources Survey, Inventory, and Plan*. Strafford Rockingham Regional Council Historic Preservation Assistance Project. On file at the New Hampshire Historical Society, Concord, NH.

United States Department of Agriculture (USDA)

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- 1994 *Soil Survey of Rockingham County, New Hampshire*. Soil Conservation Service. U.S. Government Printing Office, Washington, D.C.

United States Geological Survey (USGS)

- | | |
|------|--|
| 1895 | Dover Quadrangle. United States Geological Survey. Reston, Virginia. |
| 1896 | Dover Quadrangle. United States Geological Survey. Reston, Virginia. |
| 1941 | Dover Quadrangle. United States Geological Survey. Reston, Virginia. |
| 1993 | Dover Quadrangle. United States Geological Survey. Reston, Virginia. |

Woodlot Alternatives, Inc.

- 2003 *Dam Removal Feasibility Study, Winnicut River Dam, Greenland, New Hampshire.*
Proposal submitted to the Office of State planning, State of New Hampshire, Concord,
NH.

28. Surveyor's Evaluation

NR listed: district ☐
 individuals ☐
 within district ☐
 Integrity: yes ☐
 no ☒

NR eligible:	<input type="checkbox"/>
district	<input type="checkbox"/>
not eligible	<input checked="" type="checkbox"/>
more info needed	<input type="checkbox"/>

NR Criteria:

A	<input type="checkbox"/>
B	<input type="checkbox"/>
C	<input type="checkbox"/>
D	<input type="checkbox"/>
E	<input type="checkbox"/>

If this Area Form is for a Historic District: # of contributing resources: _____
of noncontributing resources: _____

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Photo 1 description: View from the east end of the dam, looking southwest.

Roll: 1 Frame: 21A Direction: west Date taken: 8/20/03 Negative stored: PAL



Photo 2 description: View toward the east end of the dam, from the southwest corner of the area.

Roll: 2 Frame: 12 Direction: northeast Date taken: 8/20/03 Negative stored: PAL

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Photo 3 description: Route 33 bridge from the west end of the dam.

Roll: 2 Frame: 11 Direction: southwest Date taken: 8/20/03 Negative stored: PAL



Photo 4 description: View of the top of the dam, from the east side.

Roll: 1 Frame: 19A Direction: northwest Date taken: 8/20/03 Negative stored: PAL

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Photo 5 description: View from the west side of the dam, of the east wing wall.

Roll: 1 Frame: 16A Direction: south Date taken: 8/20/03 Negative stored: PAL



Photo 6 description: View of the west wing wall and fish ladder.

Roll: 1 Frame: 14A Direction: northwest Date taken: 8/20/03 Negative stored: PAL

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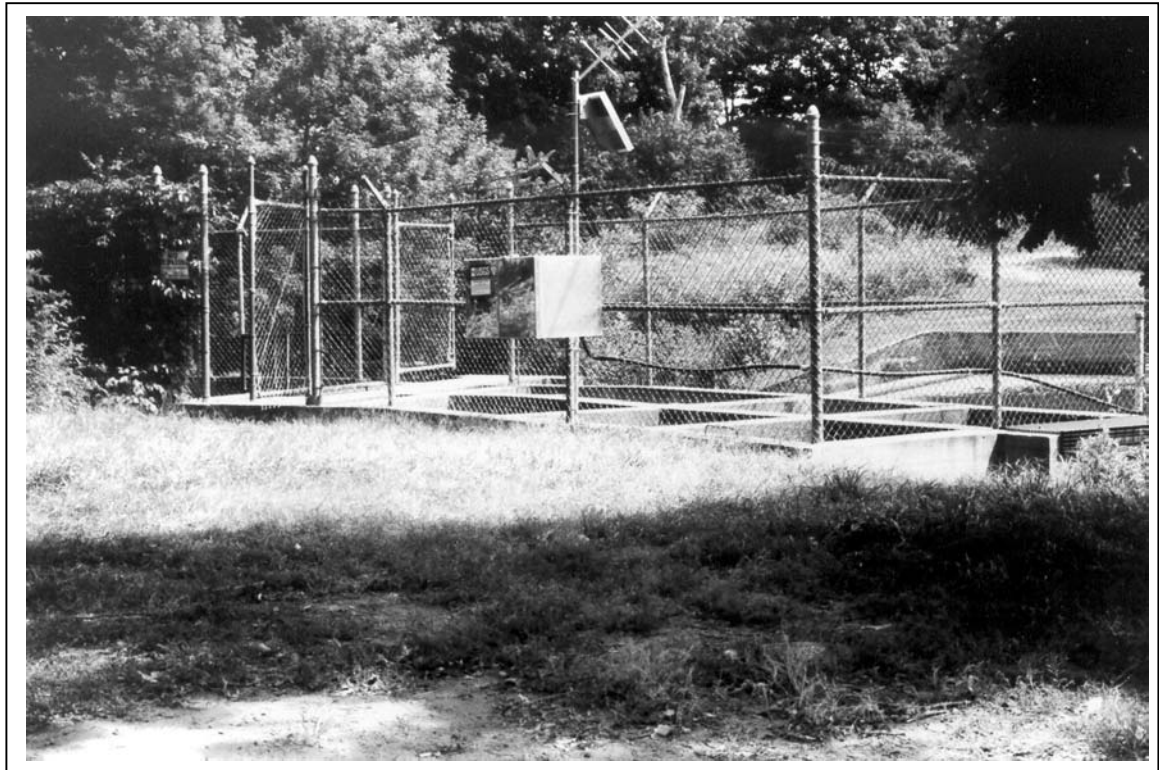


Photo 7 description: View of the top of the fish ladder, west end of the dam.

Roll: 1 Frame: 1A Direction: east Date taken: 8/20/03 Negative stored: PAL

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Map 1: *A Plan of the Town of Greenland*, by Phinehas Merrill. 1806.



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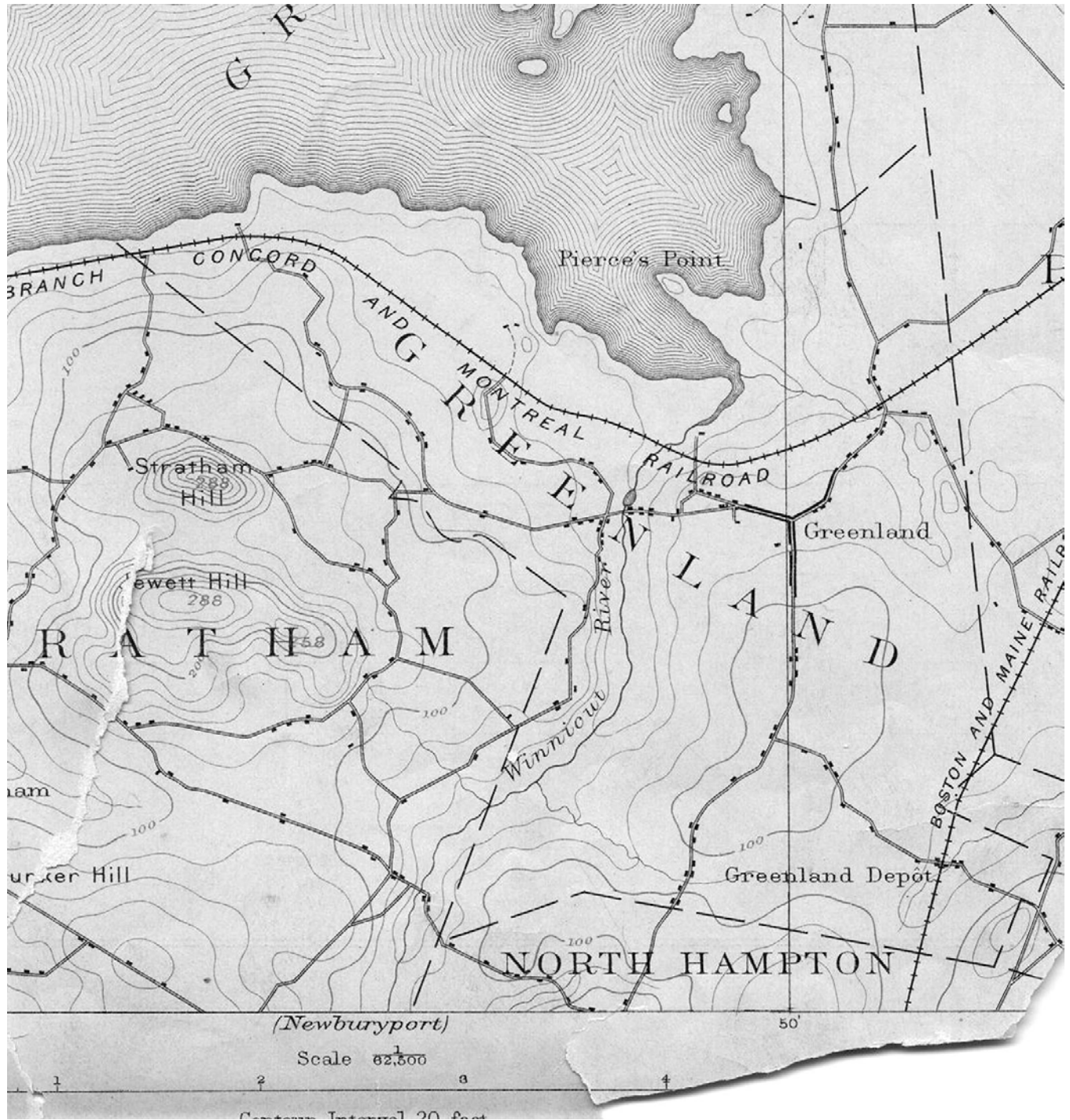
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Map 2: *Town & City Atlas of the State of New Hampshire, Greenland*, by D.H. Hurd & Co. 1892.



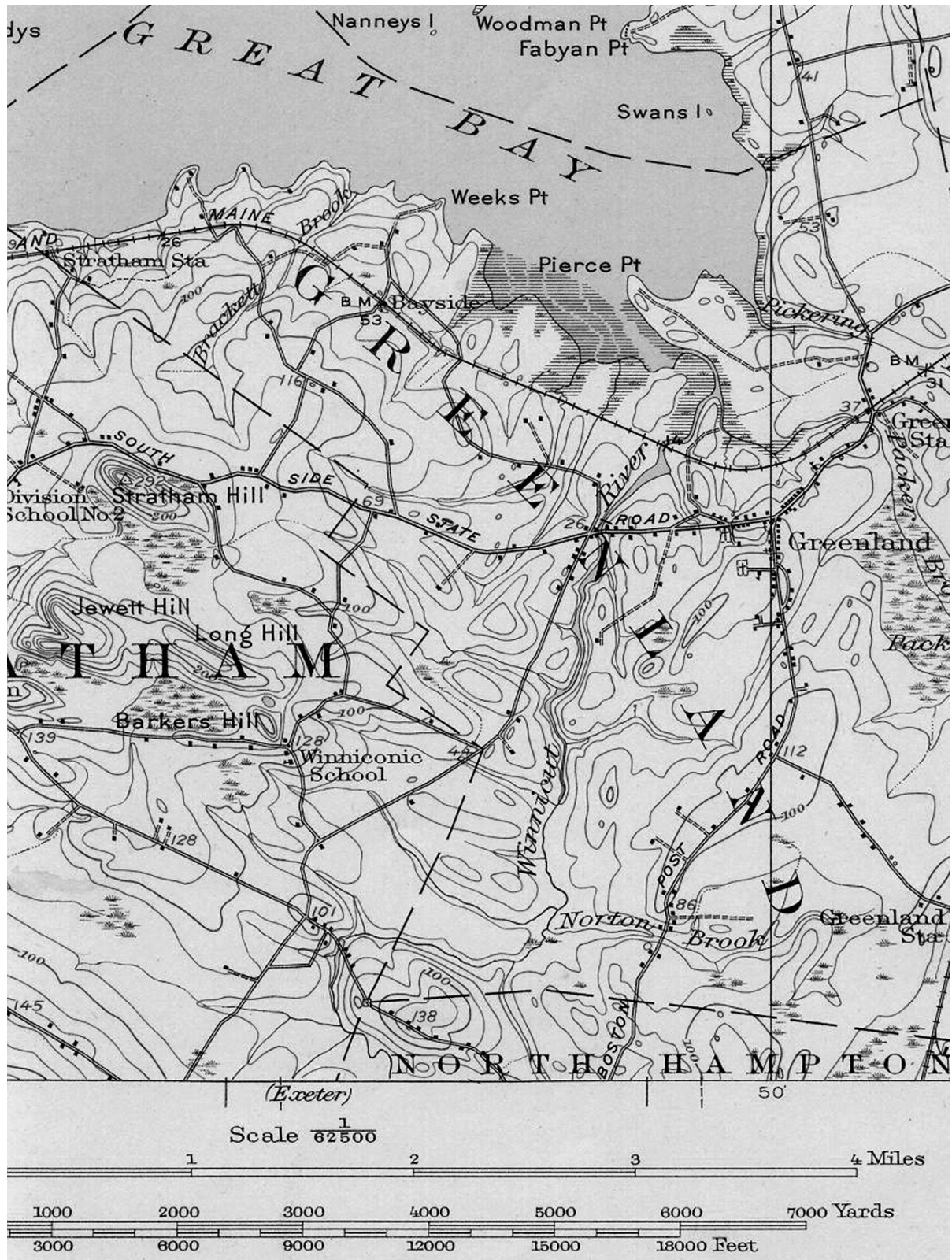
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Map 3: *Dover Quadrangle*, U.S. Geological Survey. 1895.

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Map 4: *Dover Quadrangle*, U.S. Geological Survey. 1916.

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Map 5: *Dover Quadrangle*, U.S. Geological Survey. 1941.

